



PROGRAM OBJECTIVES (POS)

1. **Pharmacy Knowledge:** An ability to acquire , demonstrate, core and basic knowledge of Pharmaceutical and Life Sciences
2. **Planning Abilities:** An ability to develop, implement, effectively plan and organize work using time management, resource management, delegation skills and organizational skills to achieve goals in specified timeline.
3. **Problem Analysis:** An ability to identify, analyze, interpret data and take appropriate decision to solve problems related to routine Pharmacy Practices by applying acquired knowledge.
4. **Modern Tool Usage:** An ability to understand, choose and utilize Modern techniques and computing tools for Pharmacy practices by considering constraints.
5. **Leadership Skills:** An understanding of pharmaceutical management principles and apply these to one's own work, as a member and leader in a team, to manage projects to facilitate improvement in social health and well being.
6. **Professional Identity:** Ability to recognize, analyze and communicate Pharmacy professional values as a healthcare promoter.
7. **Pharmaceutical Ethics:** Ability to understand and use professional, ethical, legal, social issues and responsibilities for well being of the society.
8. **Communication:** An ability to comprehend, write reports, present and document to communicate effectively for exchange of professional information to Pharmacy community and society.
9. **The Pharmacist and Society:** An ability to overcome the societal, health and legal problems by providing better pharmaceutical care relevant to the Pharmacy profession.
10. **Environment and Sustainability:** An ability to recognize the impact of the professional Pharmaceutical solutions in social and environmental circumstances for sustainable development.
11. **Life-Long Learning:** An ability to recognize the need to engage in continuous Professional development by taking in consideration timely feedback and technological



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changes for lifelong learning process.

PROGRAM SPECIFIC OUTCOMES (PSO)

Pharmacy Students are able to:

PSO 1: Build graduate to excel in technical or professional careers in various pharmaceutical industry and/or institute and /or Health care system through rigorous education. Also analyze and communicate the skills, values of their professional roles in society.

PSO 2: Learn, select, apply appropriate methods, procedures, resources and modern pharmacy-related computing tools with an understanding of the limitations.

PSO 3: Operate, control, analyze and evaluate chemical substances and finished products also processes within permissible limits.

PSO 4: Design a system, component or process to meet desired needs within realistic constraints such as economic, environmental, sustainability social, ethical, health, safety and manufacturability for humans.



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Course Outcomes (CO's)

FIRST YEAR B. PHARMACY			
Semester I			
Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
BP101T	Human Anatomy and Physiology I	1	Recall [L1:Remembering] about the gross morphology, structure and functions of cell, skeletal, muscular, cardiovascular system of the human body.
		2	Classify [L2:Understanding] the various homeostatic mechanisms and their imbalances.
		3	Identify [L1:Understanding] the different types of bones in human body & various tissues of different systems of human body.
		4	Apply about the various experimental techniques [L3:Applying] related to physiology learnt various techniques like blood group determination, blood pressure measurement, blood cells counting.
BP102T	Pharmaceutical Analysis I	1	Learn [L1:Remembering] definition and scope of different techniques of analysis.
		2	[L2:Understanding] Understand the principles of volumetric and electro chemical analysis.
		3	[L2:Understanding] methods of expressing concentration, Primary and secondary standards, preparation and standardization of various molar and normal solutions and errors.
BP103T	Pharmaceutics I	1	[L1:Remembering] Know the history of profession of pharmacy.



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		2	[L2:Understanding] Understand the basics of different dosage forms, pharmaceutical incompatibilities and pharmaceutical calculations.
		3	[L2:Understanding] Understand the professional way of handling the prescription.
		4	[L3:Applying] Preparation of various conventional dosage forms.
BP104T	Pharmaceutical Inorganic Chemistry	1	Understand [L1:Remembering] principle, and to know the sources of impurities and methods to determine the impurities in inorganic drugs and pharmaceuticals inorganic chemistry.
		2	Understand the medicinal and pharmaceutical importance of inorganic compounds [L1: Remembering] and practical skills of inorganic compounds [L3: Applying].
		3	Discuss and Know pharmaceuticals inorganic compound [L2:Understanding] and to understand its chemical and physical properties [L3: Applying]
BP105T	Communication Skills	1	Understand [L2:Understanding] behavioral needs for a Pharmacist to communicate effectively in areas of pharmaceutical operations.
		2	Lead the team effectively and will manage it efficiently [L3:Applying]
		3	Learn effective presentation and interview skills [L3:Applying]
BP106 RBT	Remedial Biology	1	[L2:Understanding] know the classification and salient features of five kingdoms of life.
		2	Understand [L2:Understanding] the basic components of anatomy & physiology of plant.





		3	Know understand [L2:Understanding] the basic components of anatomy & physiology animal with special reference to human.
BP106 RMT	Remedial Mathematics	1	[L1:Remembering] Know the theory and their application in Pharmacy.
		2	Solve the different types of problems by applying theory [L3:Applying]
		3	[L2:Understanding] Appreciate the important application of mathematics in Pharmacy.
BP107P	Human Anatomy and Physiology I	1	Recall [L1:Remembering] the construction, working, care and handling of instruments, glassware's and equipment's required for practical.
		2	Explain [L2:Understanding] the significance of Bleeding time, Clotting time, Blood group detection, Haemoglobin detection and measurement of blood pressure.
		3	Knowledge of mechanism of White Blood Cell Count and Red Blood Cell Count of blood sample [L3:Applying]
		4	Students would learn about the various experimental techniques [L3:Applying] related to physiology learnt various techniques like blood group determination, blood pressure measurement, blood cells counting.
BP108P	Pharmaceutical Analysis I	1	Perform [L4:Analyzing] limit test of different compounds.
		2	Carry out various volumetric and electrochemical titrations [L4:Analyzing]
		3	Determination [L4:Analyzing] of Normality by electro-analytical methods.
BP109P	 Pharmaceutics I	1	Fundamental knowledge [L3:Applying] in preparing conventional dosage forms like Syrups, Elixirs, Linctus, Solutions, Suspensions, Emulsions.
		2	[L3:Applying] Preparations of Powders and Granules.



		3	[L3:Applying] Preparations of Suppositories, Semisolids and Gargles and Mouthwashes.
BP110P	Pharmaceutical Inorganic Chemistry	1	Understand[L1:Remembering] principle, and to know the sources of impurities and methods to determine the impurities in inorganic sample.
		2	Understand the medicinal and pharmaceutical importance of synthesis of inorganic compounds[L1:Remembering] and practical skills of inorganic compounds [L3:Application].
		3	Discuss and Know pharmaceuticals inorganic compound L2:Understanding] and to understands its chemical and physical properties[L3:Applying].
BP111P	Communication Skills	1	[L2:Understanding] Understand and evaluate key theoretical approaches used in the interdisciplinary field of communication.
		2	[L3:Applying] Develop knowledge, skills, and judgment around human communication that facilitate their ability to work collaboratively with others.
		3	[L4:Analyzing] Communicate effectively orally and in writing.
		4	Find, use, and [L5:Evaluating] evaluate primary academic writing associated with the communication discipline.
BP112RBP	Remedial Biology	1	[L3:Applying] Study of Microscope, Section cutting techniques, Mounting and staining, Permanent slide preparation, Stem, Root, Leaf, seed, fruit, flower and their modifications.
		2	[L2:Understanding] Study of cell and its inclusions.
		3	[L2:Understanding] Detailed study of frog by using computer models.





		4	Microscopic study and [L4:Analyzing] identification of tissues pertinent to Stem, Root Leaf, seed, fruit and flower.
Semester II			
Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
BP201T	Human Anatomy and Physiology II	1	Study [L1:Remembering] of Nervous , Endocrine ,digestive, respiratory, cardiovascular ,urinary ,reproductive, integumentary system and special senses with the help of models, charts and specimens.
		2	Demonstrate [L2:Understanding] general neurological examination, the function of olfactory nerve , visual acuity, reflex activity , positive and negative feedback mechanism and total blood count by cell analyser.
		3	Record [L1:Remembering] body temperature, basal mass index.
		4	Examine [L4:Analyzing] the different types of taste and determine tidal volume and vital capacity.
		5	Identify [L3:Applying] the Permanent slides of vital organs and gonads and study [L1:Remembering] family planning devices and pregnancy diagnosis test.
BP202T	Pharmaceutical Organic Chemistry	1	[L3:Applying] Write the structure, name and the type of isomerism of the organic compound.
		2	[L3:Applying] Write the reaction, name the reaction and orientation of reactions.
		3	[L2:Understanding] Account for reactivity/stability of compounds.





BP203T	Biochemistry	1	[L2:Understanding] Understand the significance, concepts of Cell and applications of biochemistry.
		2	Describe [L1:Remembering] the chemistry, biological functions of Carbohydrates, Lipids, Proteins, Vitamins and Amino acids.
		3	[L3:Applying] Apply the mechanism of enzyme action and identify the classes of enzymes and factors affecting action, mechanism of electron transport chain.
		4	Explain [L4:Analyzing] the synthesis of nucleic acids, their role in metabolic pathways transcriptional, translational, and post-translational levels, Hereditary Diseases.
		5	Discuss [L2:Understanding] the metabolic pathways of Carbohydrates, Lipids, Proteins and Amino Acids.
BP204T	Pathophysiology 	1	Understand [L1:Remembering] basic principles of cell injury its adaptations [L2:Understanding] and process of inflammation.
		2	Get in-depth knowledge [L1&L2:Remembering & Understanding] of pathogenesis of cardiovascular, respiratory and renal disorders.
		3	Study pathophysiology [L1:Remembering] and complications [L2:Understanding] of hematological, endocrine, nervous and gastrointestinal system.
		4	Summarize [L2:Understanding] signs and symptoms of different inflammatory diseases, diseases of bones, joints and cancer.
		5	Explain [L2:Understanding] etiology and pathogenesis of infectious diseases.
BP205T	Computer Applications in Pharmacy	1	Apply [L3:Applying] the knowledge of mathematics and computing fundamentals to pharmaceutical applications for any given requirement.



		2	Design and develop [L6:Creating] solutions to analyze pharmaceutical problems using computers.
		3	Integrate and [L3:Applying] apply efficiently the contemporary IT tools to all Pharmaceutical related activities.
		4	Solve [L5:Evaluating] and work with a professional context pertaining to ethics, social, cultural and regulations with regard to Pharmacy.
BP206T	Environmental Sciences	1	Create [L6:Creating] the awareness about environmental problems among learners.
		2	Impart basic knowledge [L2:Understanding] about the environment and its allied problems and 3. Develop an attitude of concern for the environment.
		3	Acquire skills to help the concerned individuals in identifying [L4:Analyzing] and solving environmental problems.
BP207P	Human Anatomy and Physiology II	1	Study [L1:Remembering] of Nervous , Endocrine ,digestive, respiratory, cardiovascular ,urinary ,reproductive, integumentary system and special senses with the help of models, charts and specimens.
		2	Demonstrate [L2:Understanding] general neurological examination, the function of olfactory nerve , visual acuity, reflex activity , positive and negative feedback mechanism and total blood count by cell analyser.
		3	Record [L1:Remembering] body temperature, basal mass index.
		4	Examine [L4:Analyzing] the different types of taste and determine tidal volume and vital capacity.
		5	Identify [L3:Applying] the Permanent slides of vital organs and gonads and study [L1:Remembering] family planning devices and pregnancy diagnosis test



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BP208P	Pharmaceutical Organic Chemistry I	1	[L2:Understanding] Safety measures in an organic laboratory.
		2	[L2:Understanding] Introduction to laboratory techniques.
		3	Systematic qualitative [L4:Analyzing] analysis of unknown organic compounds.
		4	Preparation [L3:Applying] of suitable solid derivatives from organic compounds.
		5	Building [L6:Creating] of molecular models of structures containing various functional groups.
BP209P	Biochemistry	1	[L1:Remembering] Study the concept of enzyme hydrolysis and examine the role of enzyme in day to day life.
		2	[L2:Understanding] Understand the various qualitative tests for identification of biomolecules.
		3	[L3:Applying] Determine the pH and blood constitute like blood sugar, blood creatinine and total serum cholesterol.
		4	[L4:Analyzing] Estimation of reducing sugar by DNS method, proteins by Biuret method and urine abnormalities.
BP210P	Computer Applications in Pharmacy	1	Design [L6:Creating] a questionnaire using a word processing package or Design a form in MS Access to view, add, delete and modify the patient record in the database.
		2	Create [L6:Creating] a HTML web page or mailing labels Using Label Wizard or database in MS Access or invoice table using – MS Access and Creating and working with queries in MS Access.
		3	Retrieve the information of a drug and its adverse effects using online tools [L3:Applying].





		4	Generating report and printing the report from patient database [L3:Applying].
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SECOND YEAR B. PHARMACY			
Semester III			
Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
BP301T	Pharmaceutical Organic Chemistry II	1	Understand the basic knowledge of Benzene and its Derivatives, Analytical, synthetic and other evidences in the derivation of structure of benzene.
		2	General methods of preparation and reactions of Phenols, Aromatic Amines and Aromatic Acids. Also an emphasize on definition, types, classification, principles/mechanisms, applications, examples and differences of Fats and Oils
		3	To study Structure and medicinal uses of Naphthalene, Phenanthrene, Anthracene, Diphenylmethane, Triphenylmethane and their derivatives
		4	To study in details about various theories of Cyclo alkanes like Baeyer's strain theory, Coulson and Moffitt's modification, Sachse Mohr's theory
BP302T	Physical Pharmaceutics I	1	Describe the process of solubility of different drug/excipients, diffusion and dissolution and distribution phenomena for application in the design of dosage form.
		2	To learn how to use the physicochemical properties of the state of matter and their importance in the development of pharmaceutical dosage forms.
		3	To learn basic principles and properties of powders, granules in design of solid dosage form.



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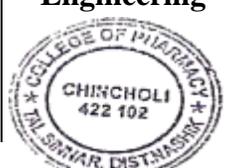
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		4	The students will get theoretical as well as practical knowledge of the complexation
		5	Understand basic knowledge of pH, buffers and isotonicity in pharmaceutical as well as in biological system.
BP303T	Pharmaceutical Microbiology	1	To understand different methods & technique of identification, cultivation and preservation of various microorganisms
		2	To understand the importance and implementation of sterilization in pharmaceutical processing and industry by understanding sterilization procedure, instrument handling along with their mechanism.
		3	To study need of sterility testing, to learn basic principles & Procedure of sterility testing of pharmaceutical products.
		4	To Carry out microbiological standardization of Pharmaceuticals including presence and absence of micro-organism as well as counting of total number of micro-organism
		5	To Understand the cell culture technology and its applications in pharmaceutical industries.
BP304T	Pharmaceutical Engineering	1	Describe [L1: Remembering] the various unit operations and state [L2: Understanding] the principles, mechanisms and theories of different unit operations used in pharmaceutical industry
		2	Explain [L2: Understanding] the working principles and constructions of equipments used for handling unit processes in pharmaceutical industries
		3	Apply [L3: Applying] the various concepts of unit operations and compare [L4: Analyze] the several operations.





		4	Illustrate [L2: Understanding] the different materials used in the pharmaceutical plant constructions and explain [L2: Understanding] the concept of corrosion and material handling.
BP305P	Pharmaceutical Organic Chemistry II	1	Experiment with [L3: Applying] laboratory techniques like Recrystallization and Steam distillation
		2	Analyze [L4: Analyzing] oil values including standardization of reagents.
		3	Develop [L3: Applying] various synthetic compounds using suitable reaction.
BP306P	Physical Pharmaceutics I	1	Learn [L1: Knowledge] and evaluate [L5: Evaluating] the process of solubility and pKa determination.
		2	Learn [L1: Knowledge] and evaluate [L5: Evaluating] partition coefficient.
		3	Learn [L1: Knowledge] and evaluate [L5: Evaluating] critical micelle concentration, HLB number and surface tension of surfactant.
		4	Get theoretical as well as practical knowledge [L2: Understanding] of the complexation and protein binding.
		5	Understand [L2: Understanding] basic knowledge of critical solution temperature and refractive index.
BP307P	Pharmaceutical Microbiology	1	Understand [L2: Understanding] microscopy and preparation & sterilization of media.
		2	Examine [L4: Analyzing] different staining techniques and motility of microorganism.
		3	Evaluate [L5: Evaluating] minimum inhibitory concentration of disinfectant.
BP308P	Pharmaceutical Engineering 	1	Description [L2: Understanding] and demonstration of Pharmaceutical Machinery.
		2	Determination [L4: Analyzing] of radiation constant, the overall heat transfer coefficient, humidity, moisture content and loss on drying, Calculate [L4: Analyzing] the efficiency of steam distillation, uniformity index
		3	Study [L4: Analyzing] the factors affecting rate of filtration and evaporation and the effect of time on the rate of crystallization



		4	Evaluate [L5: Evaluation] the size distribution of tablet granulation and verify the laws of size reduction
Semester IV			
Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
BP401T	Pharmaceutical Organic Chemistry III	1	To understand [L1: Understanding] principle, synthesis, manufacturing process, of some important heterocyclic and polycyclic compounds [L4: Analyzing] Understand basics of chemical process for new compounds and formulations
		2	To understand Theoretical chemical process, reaction system, chemical equipments used in manufacturing [L1: Understanding] and practical skills of the instruments [L3: Analyzing]
		3	Various techniques of combinatorial chemistry and understand applications of combinatorial chemistry in the speedy synthesis of organic compounds and peptides [L2: Understanding] and guidelines involved in retrosynthesis and construct retrosynthesis of pharmaceutically important compound [L3: Remembering]
		4	To understand basics of chemical process for new compounds [L1: Understanding] and formulations
BP402T	Medicinal Chemistry I	1	To understand [L2: Understand] history classification, structure and adverse effect of medicinally important compounds and study the path way of drug metabolism and designing of new molecule [L3: Apply] with its therapeutic application.
		2	To understand Theoretical [L1: Knowledge] and practical [L3: Apply] skills in synthesis of medicinal and study the Structure activity relationship



			of drug molecule
		3	Discuss the synthesis the medicinally important compound [L4: create] and perform purification process [L3: Application] guidelines.
BP403T	Physical Pharmaceutics II	1	Knowledge [L1: Remembering]: Know the types, properties, purification, stabilization and applications of colloids in the formulations.
		2	Breadth [L2: Understanding]: Illustrate the different types of flow in order to identify and choose suitable flow characteristics for the formulation and study of deformation of solids. Understand the properties of particles and pharmaceutical powders, their significance in formulating pharmaceutical products, and the common methods for characterizing these properties and application in pharmacy
		3	Comprehension [L2: Understanding]: Illustrate the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations.
		4	Application [L3: Applying]: Analyze the behavior, physicochemical properties and mechanism of drugs and excipients in the formulation development and evaluation of dosage forms.
BP404T	Pharmacology I 	1	Understand [L1: Remember] in detailed about Pharmacokinetics and pharmacodynamics along with the adverse effects, clinical uses, interactions, doses, contraindications and route of administration of different classes of drugs
		2	Understand [L2: Understanding] the drugs acting on the peripheral

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			nervous system .
		3	Understand [L2: Understanding] the drugs acting on the central nervous system of the body
BP405T	Pharmacognosy & Phytochemistry I	1	To know the techniques in the cultivation and production of crude drugs.
		2	To know the crude drugs, their uses and chemical nature.
		3	Know the evaluation techniques for the herbal drugs.
		4	To carry out the microscopic and morphological evaluation of crude drugs.
BP406P	Medicinal Chemistry I	1	Understand [L2: Understanding] structure and and study the path way of drug metabolism and designing of new molecule [L3: Applying] with its therapeutic application.
		2	Understand theoretical [L1: Remembering] and practical [L3: Applying] skills in synthesis of medicinal and study the Structure activity relationship of drug molecule
		3	Discuss the synthesis the medicinally important compound [L4: Creating] and perform purification process [L3: Applying] guidelines.
BP407P	Physical Pharmaceutics II	1	Determine [L3: Applying] of particle size, particle size distribution using different methods.
		2	Determine [L3: Applying] bulk density, true density, porosity angle of repose and viscosity of liquid using Ostwald's viscometer.
		3	Determine [L3: Applying] sedimentation volume with effect of different suspending agent
BP408P	Pharmacology I	1	Recall [Remember L1] the commonly used instruments & learn about common laboratory animals by simulation
		2	Understand [Understand L2] the common laboratory techniques blood withdrawal, serum, plasma separation and anesthetics by simulation



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		3	Understand [Understand L2] the effect of drugs on ciliary motility of frog oesophagus and rabbit eye. Skeletal muscle relaxants activity using rota-rod apparatus and locomotor activity using actophotometer, Anticonvulsant effect, stereotype and anti-catatonic activity, anxiolytic activity, local anesthetics by different methods by simulation.
BP409P	Pharmacognosy & Phytochemistry I	1	Know [L2: Understanding] the techniques in the cultivation and production of crude drugs.
		2	Know [L2: Understanding] the crude drugs, their uses and chemical nature.
		3	Examine [L4: Analyzing] microscopic and morphological evaluation of crude drugs.
		4	Evaluate [L5: Evaluating] techniques for the herbal drugs.

THIRD YEAR B. PHARMACY

Semester V

Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
BP501T	Medicinal Chemistry II	1	[L2: Understanding] Study the development of the classes of drugs with respect to its chemistry and pharmacological activity.
		2	[L2: Understand] Explain the Structure Activity Relationship, mechanism of action, synthesis and use of drugs mentioned in the syllabus.
		3	Discuss [L2: Understand] the relationship between the structures of medicinal compounds and their biological activity.
		4	[L3:Applying] Apply the principles of synthetic chemistry to predict the synthesis of drug molecules.
BP502T		1	Identify [L1: Remembering]. preformulation, goals and objectives [L2: Understanding] study of physicochemical characteristics of drug substances. [L3: Applying] Use of preformulation considerations in the

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		development of solid, liquid oral and parenteral dosage forms and its impact on stability of dosage forms.
	2	Explain [L2: Understanding] tablets as a dosage form, physico-chemical principles guiding tablet formulation, various tablet additives, manufacture & evaluation [L4: Analyzing], equipments, defects in tableting & remedies. Summarize [L2: Understanding] Formulation and manufacturing consideration of syrups and elixirs suspensions and emulsions
	3	Describe [L1: Remembering] capsules, types, additives, size selection, manufacturing & evaluation [L4: Analyzing], equipments, & defects. Explain [L2: Understanding] pellets, formulation requirements, pelletization process, equipments for manufacture of pellets.
	4	Give [L2: Understanding] various considerations in development of Parenteral and Ophthalmic dosage forms. Develop [L3: Applying] solid, liquid and semisolid dosage forms and evaluate [L5: Evaluating] them for their quality.
	5	Give [L2: Understanding] various considerations in development of Cosmetics, Pharmaceutical Aerosol and Packaging materials. Develop [L3: Applying] solid, liquid and semisolid dosage forms and evaluate [L5: Evaluating] them for their quality. Choose [L1: Remembering] containers





			and connect [L3: Applying] legal and official requirements for containers, stability aspects of packaging materials,
BP503T	Pharmacology II	1	Understand [L2: Understanding] the mechanism of drug action and its relevance in the treatment of different Cardiovascular and urinary disorders
		2	Classify [L2: Understanding] autocooids and understand [L2: Understanding] mechanism of action, therapeutic effects, clinical uses, side effects and contraindications of autocooids
		3	Get in-depth knowledge [L2: Understanding] the essential pharmacotherapy and pharmacological features of common and important drugs used in endocrine system.
		4	Understand [L2: Understanding] Understand the basic concepts of bioassay
BP504T	Pharmacognosy and Phytochemistry II	1	Know [L2: Understanding] the modern extraction techniques, characterization and identification of the herbal drugs and phytoconstituents
		2	Understand [L1: Remembering] the production of Phytoconstituents /herbal formulation.
		3	Understand [L1: Remembering] the metabolic pathways in formation of secondary metabolites and application of biogenetic studies.
		4	Understand [L1: Remembering] and explain [L2: Understanding] the applications [L3: Applying] carryout isolation and





			identification of phytoconstituents.
BP505T	Pharmaceutical Jurisprudence	1	Understand [L2: Understanding] the basic knowledge of Pharmaceutical legislations, and their implications in the development and marketing of pharmaceuticals Products
		2	To emphasize on code of ethics during the pharmaceutical practice
		3	To study regulatory authorities and agencies governing the manufacture and sale of pharmaceuticals
BP506P	Formulative Pharmacy	1	Conduct [L2: Understanding] preformulation studies and evaluate [L5: Evaluating] drugs or excipients for Physiochemical properties .
		2	Formulate [L6: Creating], evaluate [L5: Evaluating] and label the prepared Tablets, Granules, and Capsules.
		3	Formulate [L6: Creating], evaluate [L5: Evaluating] and label the prepared Parenterals and Ophthalmic products.
		4	Formulate [L6: Creating], evaluate [L5: Evaluating] and label the prepared semisolids dosage forms.
		5	Evaluate [L5: Evaluating] of packing material as per I.P/USP/BP.
BP507P	Pharmacology II	1	Study the effect of different drugs on isolated frog heart by simulated experiments by softwares and videos [L2: Understanding].
		2	Study the experiments using various isolated tissue and the effect of different drugs on the concentration response curves by simulated experiments by softwares and videos [L2: Understanding].
		3	Study different types of bioassay of various drugs using different isolated tissue by simulated experiments by softwares and videos [L2: Understanding].
		4	Study the action of various drugs using preclinical models/ computer simulations [L2: Understanding].
		5	Study the types of antagonism using PA2 value [L2: Understanding].





			Understanding].
BP508P	Pharmacognosy and Phytochemistry II –	1	Morphology, histology and powder characteristics & extraction & detection of crude drugs, & isolation & detection of active principles.
		2	Separation of sugars by Paper chromatography & TLC of herbal extract.
		3	Analysis of crude drugs
Semester VI			
BP601T	Medicinal Chemistry III	1	To understand [L1: Understanding] structure, chemistry and therapeutic value of drugs [L4: Analyzing] impart fundamental knowledge on the structure, chemistry and therapeutic value of drugs.
		2	To understand and discusses the concept of quantitative structure activity relationship (QSAR) in drug design [L1: Understanding] and practical skills of (QSAR) in drug design [L3: Analyzing]
		3	Various emphasizes on the chemistry, mechanism of action, metabolism, adverse effects, Structure Activity Relationships (SAR) [L2: Understanding] and therapeutic uses and synthesis of important drugs [L3: Remembering]
		4	To understand quantitative structure activity relationship (QSAR) [L1: Understanding]
BP602T	Pharmacology III	1	Understand [L2: Understanding] the mechanism of drug action and its relevance in the treatment of respiratory and gastrointestinal disorders
		2	Get in-depth knowledge [L2: Understanding] about pharmacology and pharmacotherapy [L3: Applying] of drugs used in infectious diseases.
		3	Get in-depth knowledge [L2: Understanding] about pharmacology and pharmacotherapy [L3: Applying] of drugs used in

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			malignancy
		4	Get in-depth knowledge [L2: Understanding] about Immunopharmacology
		5	Understand [L2: Understanding] the basic concepts of chronopharmacology and Toxicology.
BP603T	Herbal Drug Technology	1	Understand [L2: Understanding] raw material as source of herbal drugs from cultivation to herbal drug product.
		2	Know [L1: Remembering] the WHO and ICH guidelines for evaluation of herbal drugs.
		3	Know [L1: Remembering] the herbal cosmetics, natural sweeteners, nutraceuticals.
		4	Understand [L1: Remembering] and appreciate [L2: Understanding] patenting of herbal drugs, GMP.
BP604T	Biopharmaceutics and Pharmacokinetics	1	Know [L3: Application] and understand the processes and terms related to the fate of drug in human body also explain and describe [L2: Understanding] factors affecting absorption of drug from Non per oral extra-vascular routes, and [L2: Understanding] distribution of drugs, Tissue permeability, binding of drugs, Vd, plasma and tissue protein binding. Also Factors affecting, Kinetics and Clinical significance of protein binding of drug
		2	Know [L3: Application] and understand Drug metabolism, metabolic pathways, factors affecting drug metabolism, [L2: Understanding] renal excretion of drugs, factors affecting renal excretion of drugs, renal clearance, Non renal routes of drug excretion of drugs . Identify [L2:





			Understanding] pharmacokinetic parameters in non-linear pharmacokinetics also understanding of BCS (Biopharmaceutical classification system) theories of dissolution, dissolution test apparatus and IVIVC.
		3	Describe [L1: Remembering] and evaluate [L5: Evaluating] bioavailability, bioequivalence and its regulatory requirements for conducting bioequivalence study, bio-waivers, bio-similar and methods to enhance the dissolution rates and bioavailability of poorly soluble drugs..
		4	Apply [L3: Application] the concept of compartment modelling and estimate [L5: Evaluating] the quantity/concentration of drug in body at any point of time also Pharmacokinetics parameters - KE, t1/2, Vd, AUC, Ka, CLT and CLR
		5	Know [L3: Application] and understand [L2: Understanding] Nonlinear Pharmacokinetics ,Factors causing Non-linearity, Michaelismenten equation, Determination of Vmax and Km. Significance of nonlinear pharmacokinetics, Explanation with example of drugs.
BP605T	Pharmaceutical Biotechnology 	1	To understand[L2: Understanding]different methods & technique of identification, cultivation and preservation of various microorganisms
		2	To understand [L2: Understanding] the importance and implementation of recombinant DNA technology handling along with their mechanism
		3	To study the immunity, to learn basic principles & Procedure of preparation of vaccine.



		4	To Carried out fermentation methods and general requirements, study of media, equipments, sterilization methods, aeration process, stirring
		5	To Understand the Microbial genetics including transformation, transduction, conjugation, plasmids and transposons.
BP606T	Quality Assurance	1	Understand [L1: Knowledge] Understand the cGMP aspects in a pharmaceutical industry
		2	[L4: Analysis] for the analysis of APIs and formulations
		3	understand & Appreciate the importance of Documentation [L1: Knowledge] and practical [L3: Application] skills of documentation
BP607P	Medicinal chemistry III	1	Understand [L1: Understanding] importance of drug design and different techniques of drug design.
		2	Prepare [L3: Applying] drugs and their intermediates.
		3	Assay [L5: Evaluating] of drugs.
BP608P	Pharmacology III	1	[L2: Understanding] Study the effect of different drugs on isolated tissue by simulated experiments by softwares and videos.
		2	[L2: Understanding] Study acute oral toxicity, Skin irritation test, eye irritation test by simulated experiments by softwares and videos.
		3	[L2: Understanding] Study the calculation of pharmacokinetic parameter and Biostatistics methods in experimental Pharmacology
		4	[L2: Understanding] Study different types of bioassay of various drugs using different isolated tissue by simulated experiments by softwares and videos
		5	[L2: Understanding] Study the Pharmacological activity of various drugs using preclinical models/ computer simulations.
BP609P	Herbal Drug Technology	1	Prepare, label & evaluate herbal / TSM formulations.
		2	Evaluate marketed cosmetic & nutraceutical formulations.





		3	Able to handle various equipment's as per SOPs & learn various demonstrations (of experiments).
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FINAL YEAR B. PHARMACY			
Semester VII			
Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
BP701T	Instrumental Methods of Analysis	1	Learner will be able to understand [L1: Knowledge] principles, instrumentation and applications of various chromatographic, spectroscopic employed [L4: Analysis] for the analysis of APIs and formulations
		2	Learner will be able to understand Theoretical[L1: Knowledge] and practical [L3: Application] skills of instruments
		3	Ability to interpret the analytical data[L4:Analysis] and identify the structure of the compound [L2: Understanding]
		4	Perform quantitative analysis of drugs form different dosage forms using various analytical tools . [L4: Analysis]
BP702T	Industrial Pharmacy II	1	[L1: Knowledge] Know the process of pilot plant and scale up of pharmaceutical dosage forms.
		2	[L2: Understanding] Understand the process of technology transfer from lab scale to commercial batch.
		3	[L1: Knowledge] Know different Laws and Acts that regulate pharmaceutical industry.
		4	[L2: Understanding] Understand the approval process and regulatory requirements for drug products.
		5	Get in-depth knowledge [L2: Understanding] about various hospitals and its organizations, its functioning, functions [L3:Applying] of hospital pharmacist, setting up of community pharmacy
		6	Understand [L2: Understanding] adverse drug reactions, drug-drug interactions, mechanism involved and its predisposing factors.



BP703T	Pharmacy Practice	1	Get in-depth knowledge [L2: Understanding] about various hospitals and its organizations, its functioning, functions [L3:Applying] of hospital pharmacist, setting up of community pharmacy
		2	Understand [L2: Understanding] adverse drug reactions, drug-drug interactions, mechanism involved and its predisposing factors.
		3	Know [L2: Understanding] functioning [L3: Applying] and role of hospital pharmacy and practice of rational drug therapy with regards to pharmacy therapeutic committee, hospital formulary and therapeutic drug monitoring.
		4	Know [L2: Understanding] Drug store management and inventory control and interpret [L3: Applying] clinical laboratory tests of specific disease state.
BP704T	Novel Drug Delivery System	1	Understand [L2 : Understanding] and describe the basic concept,design [L6:Creating] and types of controlled drug delivery system.
		2	Understand [L2 : Understanding] and describe the selection , types & application of polymers
		3	Understand [L2 : Understanding] and study the concept behind formulation and evaluation. [L5 : Evaluating] of novel drug delivery system like particulate drug carrier, pulmonary drug deliver system , naso pulmonary system ,TDDS , Mucoadhesive DDS , Microencapsulation etc.
BP705P	Instrumental Methods of Analysis	1	Acquire knowledge [L1: Remembering] for processing and interpretation of data obtained through experimentation and report the results as per regulatory requirements[L4: Analysis
		2	Take appropriate safety measures while handling instruments, chemicals and apparatus.[L3: Application]
		3	Apply (L3: Applying) pharmaceutical ethics and professional identity methods in ways appropriate to their principal areas of study.
		4	Demonstrate (L2: Understanding) skill and knowledge of current information & modern tools and techniques specific to professional identity.



BP706PS	Practice School	1	Utilize (L3: Applying) effectively oral, written & visual communication.
		2	Create (L6: Creating) an awareness and application of appropriate personal, societal and professional ethical standard.
		3	Take part in (L5: Analyzing) the skills, diligence and commitment to excellence needed to engage in lifelong learning
Semester VIII			
Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
BP801T	Biostatistics and research methodology	1	[L2: Understanding] various statistical techniques measures of central tendency & dispersion
		2	[L3: Applying] Implement various types of regression, probability and parametric test [L5: Evaluating] Assessing various pharmaceutical error
		3	[L1: Remembering] memorizing research methods, graphs. [L3: Applying] Implement non parametric test
		4	[L4: Analyzing] Illustrate practical components of clinical trial problem [L5: Evaluating] To assess, design & analysis of experiments
BP802T	Social and Preventive Pharmacy	1	Explain (L2: Understanding) the concept of health, prevention of disease and social aspects regarding health
		2	Describe (L1: Remembering) the prevention & control of diseases.
		3	Describe (L1: Remembering) the various national health programmes to control the disease
		4	Describe (L1: Remembering) the community services which is responsible for improvement of health in rural as well as urban areas.
BP804ET	 Pharmaceutical Regulatory Science	1	[L2 : Understanding] To gather knowledge of new drug discovery & development
		2	[L2 : Understanding] Relate various regulatory approval process authorities and agencies for IND
		3	[L4 : Analyzing] Correlate the procedure and technique of indian drug product in overseas market

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		4	[L2 : Understanding] unerstand of clinical trial and regulatory concepts
BP805ET	Pharmacovigilance	1	Get in-depth knowledge [L2: Understanding] of importance of drug safety monitoring, know the History and development of pharmacovigilance and its National and international scenario,and [L1: Remembering] terminologies used in pharmacovigilance and Know the International standards for classification of diseases and drugs
		2	Identify [L2: Understanding] the methods of detection of new adverse drug reactions and their assessment and demonstrate [L3: Applying] Adverse drug reaction reporting systems and communication in pharmacovigilance
		3	Analyze [L4: Analyzing] safety data during pre clinical, clinical and post approval phases of drugs' life cycle, discuss [L2: Understanding] Drug safety evaluation in paediatrics, geriatrics, pregnancy and lactation, recognize [L2: Understanding] Pharmacovigilance Program of India (PvPI) requirement for ADR reporting in india
		4	Know [L1: Remembering , L2: Understanding] ICH guidelines for ICSR, PSUR,expedited reporting, pharmacovigilance planning, CIOMS requirements for ADR reporting and [L3: Applying] Writing case narratives of adverse events and their quality
BP806ET	Quality Control And Standardization Of Herbals 	1	Explain basic test for drugs to obtain dosage form for pharmaceutical substances & medicinal plants. Explain methods for evaluation of pharmaceutical substances, medicinal plants & commercial crude drugs along with WHO guidelines for quality control for herbal drugs
		2	Describe guidelines for cGMP, GAP, GMP & GLP for quality assurance of herbal drugs in industry.
		3	Describe guidelines for quality control of herbal drugs & evaluation of safety efficacy of herbal medicines.
		4	Explain regulatory approval process & their registration in India & International markets.

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BP809ET	Cosmetic Science	1	Get in-depth knowledge [L2: Understanding] about various hospitals and its organizations, its functioning, functions [L3:Applying] of hospital pharmacist, setting up of community pharmacy
		2	Understand [L2: Understanding] adverse drug reactions, drug-drug interactions, mechanism involved and its predisposing factors.
		3	Know [L2: Understanding] functioning [L3: Applying] and role of hospital pharmacy and practice of rational drug therapy with regards to pharmacy therapeutic committee, pharmacy and practice of rational drug therapy with regards to pharmacy therapeutic committee, hospital formulary and therapeutic drug monitoring.
		4	Know [L2: Understanding] Drug store management and inventory control and interpret [L3: Applying] clinical laboratory tests of specific disease state.

FIRST YEAR M. PHARMACY

Semester I

Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
MQA 101T	Modern Pharmaceutical Analytical Techniques 	1	Understand [L1:Remembering] principles, instrumentation, working and applications of UV-VIS, HPLC and Potentiometry.
		2	Understand operation [L2:Understanding] and calibration of various analytical instruments for the assay of various APIs and formulations as per Pharmacopoeial standards [L3:Applying]
		3	Acquire knowledge [L1:Remembering] for processing and interpretation of data obtained through experimentation and report the results as per regulatory requirements [L4:Analyzing]
		4	Discuss the analytical method validation [L2:Understanding] and Validate various analytical [L4:Analyzing] methods as per ICH/USP guidelines.

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MQA 102T	Quality Management System	1	Understand [L1:Remembering] the importance of quality Quality objectives, strategic planning and its implementation. [L2:Understanding]
		2	Study [L2:Understanding] and implement [L3:Applying] the ISO management systems.
		3	Know different tools for quality improvement. [L1:Remembering]
		4	Study the analysis [L5:Evaluating] of issues in quality.
		5	Get in depth knowledge [L1:Remembering] of Quality evaluation [L5:Evaluating] of pharmaceuticals.
		6	Study [L1:Remembering] Stability testing of drug and drug substances and Statistical approaches [L3: Applying] for quality.[L2:Understanding]
MQA 103T	Quality Control and Quality Assurance	1	Understand [L2:Understanding] the various aspects of quality control and quality assurance aspects of pharmaceutical industries.
		2	Understand [L2:Understanding] the cGMP aspects in a pharmaceutical industry, documentation, quality certifications.
		3	Justify [L5:Evaluating] the scope of quality certifications applicable to Pharmaceutical industries such as Three tier documentation, eCTD.
		4	Explain [L3:Applying] the responsibilities of QA & QC departments. , scope and importance of intellectual property rights. trade mark, copyright and patents.
MQA 104T	Product Development and Technology Transfer	1	Apply [L3:Applying] the knowledge to develop new procedures of their own design of Pilot layouts.
		2	Understand [L2:Understanding] the Quality by design practices of sterile and non sterile dosage forms.
		3	Understand [L2:Understanding] the practices of packaging technology.
		4	The Regulatory requirements in drug development

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			stages [L2:Understanding]
		5	Understand [L2:Understanding] the phase of technology transfer.
MQA 105P	Pharmaceutical Quality Assurance Practical I	1	[L4:Analyzing] Use of Spectrophotometer for analysis for Pharmacopoeial compounds and their formulations.
		2	Simultaneous [L5:Evaluating] estimation of combination formulations.
		3	[L3:Applying] Effect of pH and solvent on UV spectrum of certain drugs.
		4	Use of fluorimeter for analysis of Pharmacopoeial compounds [L4:Analyzing]
		5	[L5:Evaluating] IR, NMR and Mass spectroscopy - Interpretation of spectra & structural elucidation.
		6	Use of [L4:Analyzing] colorimeter for analysis of Pharmacopoeial compounds and their formulations.
Semester II			
Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
MQA 201T	Hazards and Safety Management	1	Understand about environmental problems among learners.[L2:Understanding]
		2	Ensure safety standards in pharmaceutical industry [L1:Remembering]
		3	Empower an ideas to clear mechanism and management in different kinds of hazard management system [L3: Application]
		4	Provide comprehensive knowledge on the safety management [L1:Remembering]
MQA 202T	Pharmaceutical Validation	1	[L1:Remembering] The importance of patent and intellectual property rights.
		2	The students are trained on the qualification aspects of instruments [L3:Applying]
		3	[L3:Applying] The importance of calibration to be performed for the instruments.





		4	[L2:Understanding]The students gain knowledge on how validation are carried for various components in industry Such as instrument validation, cleaning validation and process validation.
MQA 203T	Audits and Regulatory Compliance	1	[L2:Understanding] understand concept and principles of Auditing, Audit process, Assurance Standards, and Audit of computerized Systems.
		2	[L1:Remembering] Role of quality systems and audits in pharmaceutical manufacturing environment.
		3	[L2:Understanding]Familiarize the students with the principles and procedure of auditing.
		4	[L3:Applying] Auditing of Quality Assurance and engineering department.
MQA 204T	Pharmaceutical Manufacturing Technology	1	Understand [L2:Understanding] the common practice in the pharmaceutical industry developments.
		2	Understand [L2:Understanding] the practices of aseptic process technology, non sterile and packaging technology.
		3	Understand [L2:Understanding] of principles and implementation of Quality by design (QbD).
		4	Understand [L2:Understanding] of principles and implementation of process analytical technology (PAT) in pharmaceutical manufacturing.
MQA 205P	Pharmaceutical Quality Assurance Practical II	1	[L4:Analyzing] Use of Spectrophotometer for analysis for Pharmacopoeial compounds and their formulations.
		2	Simultaneous [L5:Evaluating] estimation of combination formulations.
		3	[L3:Applying] Effect of pH and solvent on UV spectrum of certain drugs.
		4	Use of fluorimeter for analysis of Pharmacopoeial compounds [L4:Analyzing]
		5	[L5:Evaluating] IR, NMR and Mass spectroscopy - Interpretation of spectra & structural elucidation.





		6	Use of [L4:Analyzing] colorimeter for analysis of Pharmacopoeial compounds and their formulations.
Semester III			
Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
MRM 301T	Research Methodology	1	Develop [L2: Understand] understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.
		2	Have basic knowledge on qualitative research techniques [L1:Remembering]
		3	Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis [L4: Analyzing]
MQA/MPH 395	Introduction to Constitution	1	Understand [L2: Understanding] the knowledge of philosophy of the Indian constitution.
		2	Apply [L3: Applying] and discuss the fundamental rights of Indian constitution.
		3	Evaluate [L5: Evaluating] the Directive Principles of State Policy.
		4	Understand the Fundamental Duties [L2: Understanding]

FIRST YEAR M. PHARMACY			
Semester I			
Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
MPH101T	Modern Pharmaceutical Analytical Techniques	1	Understand [L1: Remembering] principles, instrumentation, working, and applications of UV-VIS, HPLC and Potentiometry.
		2	Understand operation [L2: Understanding] and calibration of various analytical instruments for the assay of various API's and formulations as per Pharmacopoeial standards [L3: Applying]
		3	Acquire knowledge [L1: Remembering] for processing and interpretation of data obtained through experimentation and report the results as per regulatory



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			requirements[L4:Analyzing]
		4	Discuss the analytical method validation [L2:Understanding] and Validate various analytical [L4:Analyzing] methods as per ICH/USP guidelines.
MPH102T	Drug Delivery System	1	Explain [L5:Evaluating]the various approaches for development of novel drug delivery systems.
		2	Enumerate [L1:Remembering] the application of Dosage Forms for Personalized medicine, Pharmacogenetics, Customized drug delivery systems, Bioelectronic medicines, 3D printing of pharmaceuticals and Telepharmacy.
		3	Identify [L4:Analyzing] the criteria for selection of drugs and polymers for the development of delivering system.
		4	Discuss [L2:Understanding] the formulation and evaluation of Novel drug delivery systems.
MPH103T	Modern Pharmaceutics	1	Explain [L5:Evaluating] the elements of Preformulation studies of different dosage form .
		2	Discuss [L2: Understanding] physics of tablets and its effects on pharmacokinetic parameters.
		3	Explain [L5: Evaluating] the Industrial Management and GMP Considerations concepts in pharmaceutical industries.
		4	Outline [L2:Understanding] the Optimization Techniques & Pilot Plant Scale Up Techniques in pharmaceutical industries.
		5	Apply [L3:Applying] the knowledge of Stability testing, sterilization process & packagind of dosage forms in pharmaceutical industries.
MPH104T	Regulatory Affairs	1	Discuss [L2: Understanding] the concepts of innovator and generic drugs, drug development process
		2	Explain [L5: Evaluating]the Regulatory guidance & guidelines for filing & approval process including Post approval regulatory requirements for actives & drug products.
		3	Explain [L5: Evaluating] prepaation of Dossiers & their submission e-formats to regulatory agencies across the globe.
		4	Outline [L2:Understanding] Clinical trials requirements for approvals for conducting clinical trials.

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		5	Relate [L1: Remembering] Pharmacovigilance & process of monitoring in clinical trials.
MPH105P	Pharmaceutics Practical I	1	Evaluate [L5: Evaluating] therapeutic agents by various instrumental analytical techniques.
		2	Perform [L3: Applying] preformulation studies for development of various dosage forms.
		3	Design [L6: Creating] and optimize various types of controlled oral, transdermal and mucosal drug delivery systems.
		4	Evaluate [L5: Evaluating] various developed drug delivery systems using suitable methods.
		5	Predict [L6: Creating] pharmaceutical factors affecting drug release kinetics.
MPH201T	Molecular Pharmaceutics (Nano Tech and Targeted DDS)	1	Explain [L2: Understanding] the various approaches for development of novel drug delivery systems.
		2	Identify [L4: Analyzing] the criteria for selection of drugs and polymers for the development of delivering system.
		3	Identify [L4: Analyzing] the criteria for selection of drugs and polymers for the development of delivering system.
		4	Discuss [L6: Creating] the formulation & evaluation of Novel drug delivery systems.
MPH202T	Advanced Biopharmaceutics & Pharmacokinetics	1	Know [L3: Application] and understand the processes and terms related to the fate of drug in human body also explain and describe [L2: Understanding] factors affecting absorption of drug from Non per oral extra-vascular routes, and [L2: Understanding] distribution of drugs, Tissue permeability binding of drugs, apparent volume of drug distribution, plasma and tissue protein binding, factors affecting protein-drug binding. Kinetics of protein binding, Clinical significance of protein binding of drugs





		2	Know [L3: Application] and understand Drug metabolism, metabolic pathways, factors affecting drug metabolism, [L2: Understanding] renal excretion of drugs, factors affecting renal excretion of drugs, renal clearance, Non renal routes of drug excretion of drugs. Identify [L2: Understanding] pharmacokinetic parameters in non-linear pharmacokinetics also understanding of BCS (Biopharmaceutical classification system) theories of dissolution, dissolution test apparatus and IVIVC.
		3	Describe [L1: Remembering] and evaluate [L5: Evaluating] bioavailability, bioequivalence and its regulatory requirements for conducting bioequivalence study, bio-waivers, bio- similar and methods to enhance the dissolution rates and bioavailability of poorly soluble drugs.
		4	Apply [L3: Application] the concept of compartment modelling and estimate [L5: Evaluating] the quantity/concentration of drug in body at any point of time also Pharmacokinetics parameters - KE, $t_{1/2}$, Vd, AUC, Ka, CLT and CLR
		5	Know [L3: Application] and understand [L2: Understanding] Nonlinear Pharmacokinetics Factors causing Non-linearity, Michaelis-menten equation, Determination of Vmax and Km- Significance of nonlinear pharmacokinetics Exponotion with example of drugs, Pharmacokinetics in
MPH203T	Computer Aided Drug Delivery System 	1	Student will able to [L1 Remembering] To networking history of computers in pharmaceutical reseach & pre clinical development. [L2: Understanding] To summarizing Q&D & it's application.
		2	Explain [L2:Understanding] drug disposition modeling technique.
		3	Explain [Understanding] interpreting concept of optimization techniques.
		4	Describe [L1: Remembering] pharmaceutical application, advantages, disadvantages, current challenges & future scope of artificial intelligence & robotics.
		5	Describe [L1:Remembering] pharmaceutical application, advantages, disadvantages, current challenges & future scope of computational fluid dynamics.

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MPH204T	Cosmetic and Cosmeceuticals	1	<i>State</i> [L1: Remembering] the cosmetics and <i>generalize</i> [L2: Understanding] the concepts of cosmetics and cosmeceuticals; key excipients used in cosmetics and cosmeceuticals.
		2	<i>Discuss</i> [L2: Understanding] the building blocks for different product formulations of cosmetics and cosmeceuticals
		3	<i>Apply</i> [L3: Apply] the basic and scientific knowledge to develop [L6: Creating] various cosmetics and cosmeceuticals cosmetic preparations with desired Safety, stability, and efficacy by using current technologies in the market
		4	<i>Discuss</i> [L2: Understanding] the classification and mechanism of different key ingredients to develop cosmetics and cosmeceuticals and <i>evaluate</i> [L5: Evaluating] the different cosmetics preparation
MPH205P	Pharmaceutics Practical II	1	Compare [L4: Analyzing] the dissolution efficiency of various marketed pharmaceutical products
		2	Formulate [L6: Creating] and evaluate [L5: Evaluating] various cosmetic products
		3	Design [L6: Creating] experiments based on QbD for optimization of drug delivery
		4	Analyze [L4: Analyzing] and predict [L6: Creating] pharmacokinetic parameters using softwares
		5	Evaluate [L5: Evaluating] computational modeling of drug disposition
MRM 301T	Research Methodology	1	Develop [L2: Understand] understanding on various kinds of research, objectives of doing research, research process, research designs and sampling.
		2	Have basic knowledge on qualitative research techniques [L1: Remembering]
		3	Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis [L4: Analyzing]
	Introduction to Constitution	1	Understand [L2: Understanding] the knowledge of philosophy of the Indian constitution.





MQA/MPH 395	2	Apply [L3: Applying] and discuss the fundamental rights of Indian constitution.
	3	Evaluate [L5: Evaluating] the Directive Principles of State Policy.
	4	Understand the Fundamental Duties [L2: Understanding]

FIRST YEAR M. PHARMACY			
Semester I			
Course Code	Course Name	Course Outcomes	After successful completion of course student will able to
MPL 102T	Advanced Pharmacology-I	1	Understand [L1: Knowledge] Pharmacokinetics and Pharmacodynamic concepts related to drugs and its applications [L3: Applying].
		2	Study [L2: Understanding] and get the knowledge of neurohumoral transmission of drug with regards to ANS, CNS and NANC and relate [L3: Applying] the drug acting on the ANS.
		3	Study [L2: Understanding] and relate [L3: Applying] the drug acting on the CNS and CVS.
MPL 103T	Pharmacological and Toxicological Screening Methods-I	1	Understand [L2: Understanding] the regulations and ethical requirement for the usage of experimental animals.
		2	Get in depth knowledge [L2: Understanding] of the various animals used in the drug discovery process and good laboratory practices in maintenance and handling of experimental animals
		3	Get in-depth knowledge [L2: Understanding] of the various newer screening methods involved in the drug discovery process
		4	Understand [L2: Understanding] and correlate the preclinical data to humans
MPL 104T	Cellular & Molecular Pharmacology	1	Understand [L1: Knowledge] Cell Biology and cell signaling pathways which includes receptors, secondary messengers and intracellular signaling pathways [L3: Applying] to correlate the effect of drug at molecular level.



		2	Study [L2: Understanding] r-DNA technology, gene therapy and different DNA analysis methods and relate [L3: Applying] it to molecular pharmacology.
		3	Study [L2: Understanding] pharmacogenomics and immunotherapeutics and use it to know [L3: Applying] the applications of proteomic science.
		4	Get in depth knowledge [L1: Knowledge] of cell culture techniques, cell viability assay, glucose uptake assay, calcium influx assay, and use it [L3: Applying] in the field of drug science.
MPL 105P	Experimental Pharmacology-I	1	Carry out [L4: Analyze] estimation of compounds and study and use the knowledge [L2: Understanding and L3: Applying] by different analytical tools.
		2	Study [L4: Analyze] various in-vivo experiments using experimental animals to investigate [L5: Evaluate] the effect of drugs using different pharmacological screening models.
		3	Get in depth knowledge [L1: Knowledge] of various techniques in biotechnological processes to utilize [L3: Applying] in the field of drug science.
MPL 201T	Advanced Pharmacology-II	1	Understand [L1: Knowledge] Cellular, molecular effects of drugs acting on endocrine system and study the action [L3: Applying] of different hormones and drugs regulating it.
		2	Study [L2: Understanding] adverse effects, contraindications and clinical uses of various chemotherapeutic agents used [L3: Applying] in the treatment of diseases.
		3	Study [L2: Understanding] and relate [L3: Applying] the pathophysiology and pharmacotherapy of drugs acting on Gastro Intestinal System.
		4	Get in depth knowledge [L1: Knowledge] of Biological and



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			circadian rhythms & Free Radical Pharmacology to utilize [L3: Applying] in the field of drug science.
MPL 202T	Pharmacological and Toxicological Screening Methods-II	1	Understand [L2: Understanding] the importance of ethical and regulatory requirements for toxicity studies.
		2	Get in depth knowledge [L2: Understanding] of the various types of toxicity studies.
		3	Get in-depth knowledge [L2: Understanding] of the IND enabling studies
		4	Understand [L2: Understanding] the importance and applications of toxicokinetic studies and alternative methods to animal toxicity testing
MPL 203T	Principles of drug Discovery	1	To get in Depth Knowledge about the various Stages of Drug discovery.
		2	To understand the importance of the role of genomic, proteomics and bioinformatics in drug discovery
		3	To understand the various targets for drug discovery.
		4	To understand various Lead seeking methods and lead optimization.
		5	To understand the importance of the role of computer aided drug design in drug discovery
		6	To understand in vitro Screening systems used in drug discovery.
MPL204T	Clinical Research And Pharmacovigilance	1	Students will be capable of explaining the regulatory requirements for conducting the clinical trials
		2	Students will be able to demonstrate the type of clinical trial design
		3	The students will understand the responsibilities of key players in clinical trial
		4	The students will understand the principles of pharmacovigilance & safety monitoring system
		5	The students will understand the pharmacoepidemiology & economics
MPL 205P	Experimental Pharmacology-II	1	Record [L4: Analyzing] DRC and determine [L5: Evaluate] potency & PA2 or PD2 of drug using different bioassay methods on suitable isolated tissue preparation
		2	Study [L2: Understanding, L3: Applying] Acute toxicity studies as per OECD guidelines and determine [L4: Analyze]



			the effect of various drugs on heart, Blood Pressure of frog, rat using suitable computerized simulated software programme.
		3	Get in depth knowledge [L1: Knowledge] and study [L2: Understanding, L3:Applying] designing of protocol for clinical trial, ADR reporting and different docking studies.



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